

January 18, 2011

MEMORANDUM TO: Chairman Jaczko  
Commissioner Svinicki  
Commissioner Apostolakis  
Commissioner Magwood  
Commissioner Ostendorff

FROM: Michael R. Johnson, Director */RA/*  
Office of New Reactors

SUBJECT: QUARTERLY REPORT ON THE STATUS OF NEW REACTOR  
LICENSING ACTIVITIES—OCTOBER 1–DECEMBER 31, 2010

In response to the Commission's February 13, 2001, Staff Requirements Memorandum for COMJSM-00-0003, "Staff Readiness for New Nuclear Plant Construction and the Pebble Bed Modular Reactor," the enclosed report describes the status of new reactor licensing activities for the quarter beginning October 1, 2010, and ending December 31, 2010. The report outlines detailed information on the status of new reactor licensing reviews for design certifications, early site permits, and combined license applications for this quarter. It also provides information on regulatory infrastructure, construction inspection, advanced reactors, and international activities.

Enclosure:  
As stated

cc: SECY  
EDO  
OGC  
OCA  
OPA  
CFO

CONTACT: Christian Araguas, NRO/ARP  
(301) 415-3637

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ACTIVITIES—OCTOBER 1–DECEMBER 31, 2010

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# STATUS OF NEW REACTOR LICENSING ACTIVITIES OCTOBER 1–DECEMBER 31, 2010

## Introduction

### *New Reactor Program Overview*

Since its inception in 2006, the Office of New Reactors (NRO) has successfully served the public interest by enabling the safe, secure, and environmentally responsible use of nuclear power in meeting the Nation's future energy needs. The office's work is characterized by significant activities and accomplishments in its core responsibility areas of new reactor licensing, vendor and construction inspections, the agency's Advanced Reactor Program, and its growing international leadership. Specifically, NRO has completed several licensing activities, such as the review and issuance of four early site permits (ESPs) and a limited work authorization (LWA).

More recently, NRO's accomplishments include completing and submitting to the Commission the design certification (DC) rulemaking packages for the AP1000 and the Economic Simplified Boiling-Water Reactor (ESBWR). In addition, the office completed and submitted to the Commission the DC rule amendment for the Advanced Boiling-Water Reactor (ABWR) Aircraft Impact Assessment (AIA). Substantial progress also has been made on many of the 12 active combined license (COL) application reviews, such as completion of several safety evaluation report (SER) sections and draft environmental impact statements (DEIS). These accomplishments demonstrate the office's commitment to fulfilling its mission, and mark the significant progress that NRO has made in implementing the licensing process under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants."

In addition, NRO and Region II worked together to develop an inspection program and put in place the structure and procedures required to conduct the new reactor construction oversight program for ongoing and near-term construction activities. This new inspection program incorporates the elements in 10 CFR Part 52, such as inspections, tests, analyses, and acceptance criteria (ITAAC), incorporates lessons learned from the inspection program used in the previous construction era (1970-1980) for plants licensed under 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," and considers modular construction at remote locations. For instance, in March 2010, with the start of engineered backfill operations authorized under the LWA, safety-related construction officially began at Vogtle Unit 3; safety-related activities have also begun on Unit 4.

In 2008, NRO created the Advanced Reactor Program to provide a dedicated organization for preparing to review the Next Generation Nuclear Plant (NGNP) license application and future applications involving small modular reactors (SMRs). Recently, NRO has made significant progress in identifying key policy, licensing, and technical issues, in addition to developing resolution plans, which the staff is proactively executing. Furthermore, NRO has implemented supporting initiatives aimed at ensuring our readiness to review future SMR licensing applications. For example, similar to the design centered working group meetings, NRO has established a recurring workshop with the Nuclear Energy Institute (NEI) and industry

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representatives to address many of the ever-growing challenges facing future SMR application reviews.

We have strengthened our leadership role in the international arena by cooperating with other national nuclear regulatory authorities to address new reactor design reviews and oversight of construction. Our participation in the Multinational Design Evaluation Program (MDEP) crystallized our effective and efficient work as part of this global initiative.

#### *Quarterly Status*

NRO continues to focus on the licensing reviews and construction oversight activities necessary to address industry plans for near-term applications. Work priorities continue to focus on supporting the completion of the DC applications and COL applications with active near-term programs for construction.

The U.S. Nuclear Regulatory Commission (NRC) is currently reviewing three DC applications and two DC amendment applications. Thorough and timely reviews of these DC applications are critical to successful completion of the COL applications. In addition, the NRC has received two ABWR DC renewal requests in early fiscal year (FY) 2011. As of December 31, 2010, the NRC has 12 COL applications under active review. By letter dated September 29, 2010, Tennessee Valley Authority (TVA) requested that the NRC defer most of the Bellefonte Units 3 and 4 COL application review. By letter dated November 24, 2010, the NRC informed TVA that it agrees to defer the Bellefonte Units 3 and 4 COL application review efforts indefinitely. The NRC also agrees to review hydrology topics following the receipt of critical hydrology studies. TVA estimates that these studies may take up to 15 months to complete.

The agency's experience with these applications has demonstrated that 10 CFR Part 52 and the design-centered review approach have been successful in achieving standardization around a selected design. This standardization has resulted in a clear safety focus and resource savings. Though some reviews have been complicated by applicant revisions, the staff is making progress on the applications currently under review. For all applications, it is important that applicants minimize design and siting modifications and work aggressively to resolve open issues. In addition, COL applicants are revising the submittal dates for responses to requests for additional information (RAIs), thereby causing schedule delays and concomitant resource impacts. The NRC is working with applicants to overcome these challenges, and the staff is focused on resolving the remaining technical issues. The NRC has moved forward on reviewing applications and is on a closure path for many issues.

During this reporting period, the NRC issued DC SER chapters covering three design centers and SER COL application chapters covering two design centers to the Advisory Committee on Reactor Safeguards (ACRS). During this period, the NRC issued SERs for the remaining 10 chapters of Vogtle and presented those 10 chapters to the AP1000 ACRS subcommittee on December 15 and 16, 2010. During this period, the NRC issued SERs for the remaining 11 chapters of Summer; the AP1000 ACRS subcommittee meeting for the Summer plant is scheduled for January 10 and 11, 2011. The NRC staff submitted six South Texas Project (STP) COL SER chapters to the ACRS subcommittee for review. The staff also completed the final safety evaluation report (FSER) for the ABWR AIA. In addition, the staff submitted the rulemaking package for the ABWR AIA to the Commission for its review and has received a

favorable staff requirements memorandum (SRM). The staff completed the rulemaking package for the ESBWR DC and AP1000 DC application and submitted them to the Executive Director for Operations (EDO) in December 2010. The packages were submitted to the Commission in January 2011. The staff also completed the acceptance review for Toshiba's ABWR DC renewal application.

This report summarizes the following areas covering the first quarter of FY 2011: new reactor licensing reviews and rulemaking (organized by design center), regulatory infrastructure, construction inspection activities, advanced reactors, international activities, and funding.

### **NEW REACTOR LICENSING REVIEWS AND RULEMAKING**

The status of new reactor licensing reviews and associated rulemakings, organized by design center, is summarized below for the first quarter of FY 2011. At the beginning of each design center discussion, a table highlights key public milestone dates for each project.

#### **AP1000**

<b>Project</b>	<b>FSER</b>	<b>Final Environmental Impact Statement (FEIS)</b>	<b>Rulemaking</b>
AP1000 DCR Amendment	December 2010	Not Applicable (N/A)	September 2011
Vogtle Electric Generating Plant (VEGP), Units 3 and 4	June 2011	April 2011	N/A
Summer, Units 2 and 3	June 2011	April 2011	N/A
Bellefonte, Units 3 and 4	Suspended	Suspended	N/A
Levy County, Units 1 and 2	April 2012	April 2012	N/A
William States Lee III, Units 1 and 2	TBD*	August 2012	N/A
Shearon Harris, Units 2 and 3	TBD*	TBD*	N/A
Turkey Point, Units 6 and 7	December 2012	October 2012	N/A

\* To be determined. (These review schedule milestones are being evaluated as part of the rebaselining effort.)

## AP1000 Design Certification Rule Amendment

### General Information

Design: AP1000  
Application Type: DCR amendment  
Location: N/A  
Docket Date: January 18, 2008

### Project Schedule Risks

On November 23, 2010, the staff issued the final chapter (Chapter 1) of its SER of the AP1000 DCR amendment. The technical review of the DCR amendment is now complete. On December 2, 2010, the staff made a presentation to the ACRS full committee, and the committee issued its letter on the amendment on December 13, 2010. On December 1, 2010, Westinghouse submitted Revision 18 of the design control document (DCD). Using Revision 18 of the DCD, the staff is working to close the remaining confirmatory items in the SER.

### *Shield Building*

The technical staff completed its SER on September 27, 2010. To support a November ACRS subcommittee meeting, the staff sent SER Sections 3.7 and 3.8, which included the shield building SER, to the ACRS on November 9, 2010, along with the rest of Chapter 3 as an advanced SER, with no open items. In its December 13, 2010, letter, the ACRS agreed with the staff's SER. The staff also provided the ACRS, for its information, with a companion package that documents the response to a non-concurrence filed with respect to the shield building. The non-concurrence relates to ductility in regions of the shield building under out-of-plane shear loading. In accordance with agency policy, management has reviewed the non-concurrence and concluded that the advanced final safety evaluation report (AFSER) did not require revision to address issues raised in the non-concurrence, and agreed with the staff bases for determining that the AP1000 shield building meets regulatory requirements. A proprietary version of the documentation associated with the shield building non-concurrence and the management review is available. The staff reviewed the document for proprietary information and made a redacted version (as necessary for proprietary or other information that requires withholding) available to the public. A redacted version of the documentation of the staff non-concurrence is available, "Redacted Version of Dissenting View on AP1000 Shield Building Safety Evaluation Report With Respect to the Acceptance of Brittle Structural Module to be Used for the Cylindrical Shield Building Wall." The agency response to the dissenting view continues to support the conclusions originally included in the AFSER.

### *Digital Instrumentation & Control*

Two non-concurrences were filed on the staff's AFSER for Chapter 7 of the AP1000 design. The first non-concurrence, "Insufficient Diversity and Independence in the Implementation Process for AP1000 Instrumentation and Controls Systems," involved concerns identified with implementation of quality assurance and diversity for the developer of the Component Interface Module and Diverse Actuation System (DAS), which is a Westinghouse sub-supplier. The

proprietary documentation associated with this non-concurrence and the management review is available, as well as a public version of the non-concurrence package. Since the staff's concerns are related to the implementation of the design, a vendor inspection will be conducted to follow-up on the quality assurance and design implementation concerns in the early part of 2011. Subsequently, this non-concurrence was withdrawn based on the staff's plans to conduct the vendor inspection.

The second non-concurrence involved adequate reliability and demonstration of performance for the DAS, which uses two-out-of-two voting logic. A single failure or on-line maintenance could prevent the DAS from performing its functions. The DAS functions were determined by using a focused probabilistic risk assessment study as opposed to the deterministic, best-estimate analysis recommended in staff guidance in Standard Review Plan BTP 7-19, "Guidance for Evaluation of Diversity and Defense-in-Depth in Digital Computer-Based Instrumentation and Control Systems," and the SRM dated July 21, 1993, on SECY-93-087, "Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor (ALWR) Designs." Both design aspects were previously approved in the certified design. In accordance with agency policy, management reviewed the non-concurrence and concluded that the AFSER did not require revision to address issues raised in the non-concurrence and agreed with the staff bases for determining that the AP1000 DAS met regulatory requirements. The non-concurrence did not identify a basis for, or evidence of, safety concerns associated with the methods used in analyzing either the DAS or the functions and actuations credited in the safety analysis for the I&C system. Further, a best-estimate analysis might have provided some additional support for the conclusions in the safety evaluation; however, the existing technical documents submitted by the applicant and reviewed by the staff meet the applicable regulatory requirements and demonstrated the safety of the digital I&C system. A proprietary version of the documentation associated with this non-concurrence and the management review is available, as well as a redacted public version.

### *Rulemaking*

The staff has assembled a rulemaking team and is in the process of preparing the proposed rule for the DC amendment in parallel with completion of the FSER. The staff submitted the proposed rule package to the EDO and was forwarded to the Commission on January 3, 2011.

### Schedule Status

FSER Completion Date:

Original: March 2010

Actual: December 2010 (AFSER)

## **Vogle Combined License Application Review**

### General Information

Design Type: AP1000

Application Type: Reference Combined License (RCOL)

Location: Waynesboro, GA

Docket Date: May 30, 2008

## Project Schedule Risks

### *Design Certification*

Currently, the AP1000 DC application rulemaking is the critical path for issuance of the Vogtle COL.

### *Limited Work Authorization*

On October 2, 2009, Southern Nuclear Operating Company (SNC) and its four coapplicants submitted a request for a second LWA as part of its Vogtle COL application. The requested activities under this LWA include the following:

- installation of reinforcing steel, sumps, and drainlines and other embedded items in the nuclear island (NI) foundation base slab
- placement of concrete for the NI foundation base slab

### *Background of Second Limited Work Authorization Request*

The applicant supplemented its COL application to include a second LWA request in addition to the first LWA, which was approved with the Vogtle ESP, issued August 26, 2009. Pursuant to 10 CFR 52.24(c) and 10 CFR 50.10(e)(2), the NRC granted the first LWA, which states that SNC may perform the following activities under this LWA: installation of engineered backfill, retaining walls, lean concrete backfill, mudmats, and a waterproof membrane as described in the applicant's site safety assessment report.

The staff's advanced SER without open items evaluates the second LWA request in the relevant chapters. For example, Section 3.8.5, "Foundations," includes an evaluation of the second LWA related to the foundation base slab. To date, all 19 advanced SER chapters without open items have been issued, and no open items are associated with the second LWA request. The advanced SER without open items is intended to support issuance of the second LWA if the COL is delayed because of a contested hearing. If the applicant requests that the LWA be issued separately from the COL, a separate mandatory hearing for the second LWA would be required.

With respect to the staff's ongoing review of the COL application for Vogtle, the U.S. Environmental Protection Agency (EPA) issued the draft supplemental environmental impact statement (DSEIS) on September 3, 2010. The public meeting on the DSEIS took place October 7, 2010, in Waynesboro, GA. The public comment period ended November 24, 2010. The staff will review and respond to comments for inclusion in the final supplemental environmental impact statement (FSEIS). The FSEIS is scheduled for issuance April 2011.

### *Next Steps*

Currently, the AP1000 DC amendment rulemaking appears to be on track for completion in September or October 2011. The staff is presently developing a strategy to process the LWA.

## Schedule Status

### Review Completion Dates:

Original: FSER—December 2010  
DSEIS—Issued September 2010

Current: FSER—June 2011  
FSEIS—April 2011

In a letter dated October 29, 2010, the staff established a new schedule to rebaseline the review so that it will be consistent with the DCD schedule contained in the June 21, 2010, letter to Westinghouse.

The staff has scheduled meetings for December 2010 and January 2011 with the ACRS to review the advanced SER without open items.

## **Summer Combined License Application Review**

### General Information

Design Type: AP1000  
Application Type: Subsequent Combined License (SCOL)  
Location: Fairfield County, SC  
Docket Date: July 31, 2008

### Project Schedule Risks

#### *Design Certification*

Currently, the AP1000 DC application rulemaking is the critical path for issuance of the Summer COL. Any delay in the rulemaking schedule will result in a delay to the Summer COL schedule.

#### *Environmental Review*

The staff completed the responses to comments received on the DEIS for inclusion in the final environmental impact statement (FEIS). The staff is revising sections of the environmental impact statement (EIS) as the responses to comments dictate. The staff is addressing EPA comments on the DEIS as part of its overall effort to respond to comments received on the DEIS.

The National Marine Fisheries Service and the U.S. Fish and Wildlife Service (USFWS) submitted comments on the DEIS indicating their need for more information to complete consultations. The applicant provided revised information on transmission line routes; this information will assist the staff in addressing USFWS comments. The staff is in the process of fully reviewing this information and incorporating it into the FEIS.

## Schedule Status

Review Completion Date:

Original: FSER—February 18, 2011  
FEIS—February 3, 2011

Current: FSER—June 2011  
FEIS—April 2011

The safety review schedule was rebaselined in an October 29, 2010, letter to reflect current DC application and RCOL review schedules.

The staff has scheduled meetings with the ACRS for January and February 2011 to review the advanced SER without open items.

## **Bellefonte Combined License Application Review**

### General Information

Design Type: AP1000  
Application Type: SCOL  
Location: Jackson County, AL  
Docket Date: January 18, 2008

### Project Schedule Risks

#### *Combined License Application Review Status*

In a July 21, 2009, letter, the staff informed TVA that it will not issue a DEIS until after the TVA Board of Directors decides on whether it will complete the Babcock & Wilcox (B&W) units. On August 20, 2010, the TVA Board authorized funding to proceed with engineering studies to support the completion of B&W Unit 1. Despite deciding to fund engineering studies of the partially constructed units, the COL application for Units 3 and 4 remains a viable option for TVA. The completion and operation of Units 1 and 2 will require significant revisions to the environmental report and the standard safety analysis report. The additional requisite site studies and changes to the COL application may be completed by the second quarter of calendar year 2013.

In a letter dated September 29, 2010, TVA requested that the NRC defer most of its review of the AP1000 COL application for Bellefonte Units 3 and 4, as detailed in the enclosure to its letter. TVA also asked the NRC to provide TVA with a plan and schedule for completing the requested work. TVA has made no decision on Bellefonte Unit 1. TVA Board consideration of the final approval of Bellefonte Unit 1 is expected to occur sometime in the spring of calendar year 2011. TVA informed the NRC that if Unit 1 completion is pursued, TVA will notify the NRC.

By letter dated November 24, 2010, the NRC informed TVA that it agrees to defer the Bellefonte Units 3 and 4 COL application review efforts indefinitely. The NRC also agreed to review hydrology topics following the receipt of critical hydrology studies. TVA estimates that these studies may take up to 15 months to complete.

## Schedule Status

### Review Completion Dates:

Original: FSER—March 2011  
FEIS—January 2010

Current: FSER—suspended  
FEIS—suspended

## **Levy County Combined License Application Review**

### General Information

Design Type: AP1000  
Application Type: SCOL  
Location: Levy County, FL  
Docket Date: October 6, 2008

### Project Schedule Risks

#### *Hydrology Review*

The hydrology review requires resolution of open items in several review sections, including tsunami flooding and flooding protection requirements. The NRC issued RAIs in May 2010. The NRC staff received some RAI responses in late June 2010 and the remaining RAI responses in August 2010, but the applicant's responses did not resolve all issues. On October 4, 2010, the staff held a conference call with the applicant to discuss unresolved issues and issued additional RAIs. The staff received a partial response to these RAIs in November 2010. The staff is now evaluating the applicant's responses. The remaining RAI responses are expected in January 2011.

#### *Environmental Review*

The U.S. Army Corps of Engineers (USACE) is a cooperating agency for development of the EIS and requires information that affects its Least Environmentally Damaging Practicable Alternative (LEDPA) decision under the Clean Water Act. USACE has identified several deficiencies in the applicant's LEDPA analysis. USACE will coordinate with the applicant to address LEDPA. A preliminary indication of the USACE decision regarding LEDPA is expected in March 2011.

#### *Targeted Surveys for Federally Listed Threatened and Endangered Species*

Consultation with USFWS must be complete before issuance of the COL. Furthermore, USACE believes that consultation should be completed before issuance of the FEIS. In its response to the staff's biological assessment, USFWS stated that targeted surveys for federally protected species should be completed before the conclusion of consultation. Such surveys could take up to a year for the applicant to complete. The NRC and USACE staff will meet with USFWS to discuss the timing of surveys and expectations for consultation under the Endangered Species Act (ESA). The NRC will notify the applicant of its expectations for targeted surveys.

### Schedule Status

Review Completion Date:

Original: FSER—May 5, 2011  
FEIS—September 22, 2010

Current: FSER—April 2012  
FEIS—April 2012

In a November 30, 2010, letter, the NRC informed Progress Energy Florida, Inc., that it has revised the safety and environmental review schedules for the Levy County Units 1 and 2 COL application. The new schedule reflects completion of the FSER and FEIS in April 2012. The FEIS schedule was extended because of complex environmental issues but will not exceed the issuance date of the FSER.

### **William States Lee III Combined License Application Review**

#### General Information

Design Type: AP1000  
Application Type: SCOL  
Location: Cherokee County, SC  
Docket Date: February 25, 2008

#### Project Schedule Risks

None

#### Schedule Status

Review Completion Dates:

Original: FSER—February 2011  
FEIS—March 2010

Current: FSER—TBD  
FEIS—August 2012

The staff has drafted a revised schedule letter, to be issued in January 2011, to rebaseline the Lee schedule.

### **Shearon Harris Combined License Application Review**

#### General Information

Design Type: AP1000  
Application Type: SCOL  
Location: Wake County, NC  
Docket Date: April 17, 2008

## Project Schedule Risks

### *Issuance of Draft Environmental Impact Statement*

The staff, working with USACE as a cooperating agency, has identified several issues that remain unresolved for the environmental review. The staff anticipates that clarifying resolution strategies for these issues will lead to a revised environmental review schedule. The review team (NRC staff and USACE) is working with the applicant and relevant Federal and State agencies to determine necessary actions and schedules for resolving these issues. The applicant filed an updated Integrated Resource Plan on September 13, 2010, with the North Carolina Utilities Commission, which may delay the operational need for the two new reactors at the Shearon Harris Plant site until 2020 or later. The staff is preparing RAIs regarding the need for power from two proposed AP1000 units at the Shearon Harris site.

### *LEDPA Analysis and Alternative Selection Process*

USACE, a cooperating agency for development of the EIS, requires information to make its LEDPA decision under the Clean Water Act. USACE provided comments to the NRC on April 15, 2010, regarding supplemental information provided by the applicant on September 14, 2009. USACE identified deficiencies in the applicant's alternative sites analysis regarding alternative reservoir levels for the Shearon Harris site and aquatic impacts to the proposed and alternative sites. The applicant provided a revised analysis to USACE on September 22, 2010. USACE and EPA Region 4 are reviewing the revised analysis. The NRC staff is reviewing the applicant's revised LEDPA analysis response for potential impact on the DEIS content and schedule with respect to the NRC's alternative siting guidance in NUREG-1555, "Environmental Standard Review Plan: Standard Review Plans for Environmental Reviews for Nuclear Power Plants."

### *Clean Air Act*

The Shearon Harris site is in a Clean Air Act maintenance area for ozone and carbon monoxide. The staff must complete a Clean Air Act conformity analysis before issuing the Shearon Harris COL. Uncertainty regarding the applicant's anticipated construction schedule may affect the State of North Carolina's commitment to include project emissions in its revision to the State Implementation Plan, which would eliminate the need for staff to complete a detailed conformity analysis. The applicant submitted an updated air emissions analysis to the NRC and the State of North Carolina's Division of Air Quality (DAQ) on July 14, 2010. The DAQ provided comments to the applicant on October 6, 2010. The applicant responded to the DAQ comments on November 3, 2010. The staff is awaiting DAQ review of the applicant's responses to the DAQ technical comments and for the potential inclusion by DAQ of all project emissions in the State Implementation Plan.

### *National Historic Preservation Act Consultation*

Uncertainty regarding the applicant's schedule for completing archaeological surveys could affect the staff's ability to complete the National Historic Preservation Act consultation. While an impact assessment can be completed for the DEIS, it may not be possible to conclude the National Historic Preservation Act consultation until the applicant completes Phase II and III

surveys and provides the results to the State Historic Preservation Office (SHPO). The staff and USACE have discussed with the SHPO a path forward in line with SHPO's expectations. This is likely to result in separate memoranda of agreements (MOA) for USACE and the NRC. The applicant drafted an MOA, submitted it to the SHPO on September 22, 2010, for review, and provided it to the staff on November 2, 2010. The staff will continue discussions with USACE and the SHPO regarding the development of the potential MOA.

Schedule Status:

Review Completion Dates:

Original: FSER—April 2011

FEIS—May 2010

Current: FSER—TBD

FEIS—TBD

The staff has drafted a revised schedule letter, to be issued in January 2011, to rebaseline the Harris schedule. The staff will continue to work on the COL application review as resources allow.

**Turkey Point Combined License Application Review**

General Information

Design Type: AP1000

Application Type: SCOL

Location: Miami, FL

Docket Date: September 4, 2009

Project Schedule Risks

*Areas That May Affect the Overall Combined License Application Review Schedule*

The staff is currently developing a review schedule for the geology and seismology areas, which will involve a first-time review of various seismology parameters and models for the Caribbean region.

*Environmental Review*

Florida Power and Light (FPL) has delayed delivery of much of the information requested at the June 2010 environmental site audit. FPL provided the balance of the information on December 15, 2010, with the exception of revisions to the ground water model. The staff will continue preparation of the DEIS, review information as it becomes available, and prepare RAIs. The staff is also considering a request from the National Park Service to become a cooperating agency with the NRC in preparing the EIS. The National Park Service must perform an environmental review related to a potential land swap associated with one of the transmission lines for the proposed Turkey Point units.

### Schedule Status

The NRC has developed an initiative to use contract staff to perform the SCOL review. The NRC awarded a contract to review major parts of the application to a commercial company, which is now conducting its portion of the review.

#### Review Completion Dates:

Current: FSER—December 2012  
FEIS—October 2012

The *Federal Register* Notice for environmental scoping was published on June 15, 2010, with the scoping period closing on August 16, 2010. The *Federal Register* Notice related to notice of hearing and opportunity to petition for leave to intervene was issued on June 18, 2010, with the opportunity to intervene closing on August 17, 2010. An oral argument for the 20 contentions that were submitted through three petitions was held on November 19, 2010.

### **ESBWR**

<b>Project</b>	<b>FSER</b>	<b>FEIS</b>	<b>Rulemaking</b>
ESBWR DC	January 2011	N/A	September 2011
Fermi 3	September 2012	November 2012	N/A

### **ESBWR Design Certification Review**

#### General Information

Design: ESBWR  
Application Type: DC  
Location: N/A  
Docket Date: December 1, 2005

#### Project Schedule Risks

#### *Technical Review*

All technical reviews of the DC application is complete. The NRC staff has issued SERs of all application chapters and provided them to the ACRS for its review. The ACRS completed its review in October 2010.

#### *Rulemaking Package/Aircraft Impact Assessment Inspection*

The staff completed its inspection of the applicant's AIA on September 1, 2010. The staff's inspection report issued on October 5, 2010, contained a Notice of Violation (NOV). On October 8, 2010, General Electric-Hitachi Nuclear Energy (GEH) submitted proposed DCD revisions based on the inspection findings. On October 26, 2010, the applicant responded to the NOV. On November 10, 2010, the staff informed GEH that certain aspects of its response

to the NOV needed to be addressed in further detail. GEH determined that additional changes to the DCD were necessary as a result of its corrective actions. GEH submitted DCD Revision 9 on December 2, 2010. GEH also submitted a supplemental response to the NOV on December 3, 2010. By letter dated December 13, 2010, the staff informed GEH that its NOV response was acceptable.

The proposed rulemaking package has been updated and was submitted to the EDO on December 16, 2010. The staff expects to provide this package to the Commission in January 2011.

### **Fermi 3 Combined License Application**

#### General Information

Design: ESBWR  
Application Type: SCOL  
Location: Monroe County, MI  
Docket Date: November 25, 2008

#### Project Schedule Risks

##### *Delays in Responses to Requests for Additional Information*

On June 28, 2010, the staff issued a letter to the Detroit Edison Company (DTE) to inform the applicant that the safety and environmental review schedules (for issuance of the SER and FEIS) for the Fermi 3 COL application were now indeterminate and all remaining public milestones were TBD. The TBD status results from continuing delays in receipt of complete responses to RAls related to the environmental review and delayed receipt of a cyber security plan.

Since then, the staff has continued to review the unaffected portions of the application. The staff has received an acceptable cyber security plan and held multiple meetings to transition Fermi to the RCOL and to develop a revised safety review schedule.

On October 26, 2010, the NRC environmental staff met with cooperating agency personnel at the Detroit District USACE offices to assess progress on issues raised by USACE regarding the applicant's proposed site layout. Based on its interactions with USACE, the applicant is analyzing alternatives to certain aspects of the proposed site layout, assessing impacts to water and wetlands, and developing mitigation plans.

On December 15, 2010, the staff issued a letter to DTE informing it that public milestones for the COL review had been reestablished. However, the safety and environmental review schedules are based on DTE reaching agreement with USACE on issues related to the proposed site layout and associated impacts to water and wetlands by March 1, 2011. Further, the schedules assume that any changes to the proposed site layout will not significantly affect the staff's ongoing environmental and safety reviews, and minimal to no additional analyses or rework will be required to address these changes.

## Schedule Status

### Current Phase Completion Dates:

- Safety Review
  - Phase 1 (preliminary SER)—completed August 20, 2010
  - Phase 2 (FSER)—November 2011
  
- Environmental Review
  - Phase 1 (scoping)—completed July 2, 2009
  - Phase 2 (DEIS)—October 2011

## **ABWR**

<b>Project</b>	<b>FSER</b>	<b>FEIS</b>	<b>Rulemaking</b>
AIA DCR Amendment	October 2010	October 2010	December 2011
STP Units 3 and 4	TBD	March 2011	N/A

## **ABWR Design Certification Rule Amendment**

### General Information

Design: ABWR  
Application Type: DCR Amendment  
Location: N/A  
Docket Date: November 23, 2009  
Revision Submittal Date: June 30, 2009

### Project Schedule Risk

On May 17–21, 2010, the staff inspected the STP AIA pertaining to activities conducted in support of STP's application requesting an amendment to the ABWR DCR. Based on the results of this inspection, the staff issued an NOV. The staff accepted the applicant's NOV response on October 13, 2010, and issued the FSER on October 14, 2010. The staff responded to the ACRS review letter on October 27, 2010. The staff completed the rulemaking package and delivered it to the Commission on October 27, 2010. On November 9, 2010, the staff issued a letter to STP reestablishing the remaining milestones for the application and updated the public Web page. The Commission approved publication of the proposed rule that will amend Appendix A, "Design Certification Rule for the U.S. Advanced Boiling Water Reactor," to 10 CFR Part 52 so that applicants or licensees intending to construct and operate an ABWR may comply with the AIA rule by referencing the amended design. The next step is to publish the proposed rule.

## Schedule Status

### Review Completion Dates:

Original: Advanced SER—April 2010

Current: Advanced SER complete

Original: Environmental Assessment (EA)—June 2010

Current: EA complete

Original: Publish Proposed Rule—September 2010

Current: February 2011

## **South Texas Project Combined License Application**

### General Information

Design: ABWR  
Application Type: RCOL  
Location: Matagorda County, TX  
Docket Date: November 27, 2007  
Revision 3 Submittal Date: October 5, 2010

### Project Schedule Risks

#### *Ground Water Model (Final Safety Analysis Report, Chapter 2.4)*

The applicant encountered technical challenges in characterizing the onsite hydrology, as well as in developing, documenting, and verifying the quality of the ground water model used in assessing the radiological consequence of accidental release. As a result, RAI responses in Sections 2.4.12 and 2.4.13 have been late.

The staff conducted a site audit of the STP ground water modeling activities on May 25, 2010, and had a chance to clarify its concerns regarding the ground water modeling RAIs. The applicant submitted its responses to these RAIs on August 31, 2010. A second round of responses containing information necessary to close all open items was received December 15, 2010, and is being reviewed.

#### *Seismic Analysis (Chapter 3)*

Sections 3.7 and 3.8 of the application did not contain sufficient detail for the staff to reach safety conclusions on issues of seismic analysis and soil-structure interaction. The applicant has been responsive to staff requests for supplementary information; however, reviewing this large amount of information poses a risk to the schedule.

The staff conducted an audit in August 2010. This audit resulted in a round of RAIs and responses. The staff conducted a second audit in October 2010. As a result of the October audit, new RAIs will be issued and some of the existing RAI responses will be supplemented. The applicant and the staff have agreed on a path for resolving the remaining technical issues.

### *Flow-Induced Vibration (Chapter 3)*

Earlier this year, the applicant changed its approach toward addressing the area of flow-induced vibration; rather than citing Kashiwazaki-Kariwa Unit 6 as the prototype, the applicant determined that STP Unit 3 should serve as the prototype. As a result, the applicant had to submit a significant amount of additional information; this caused a delay in the review of Section 3.9.2 of the final safety analysis report (FSAR).

The staff has conducted multiple audits and is largely satisfied with the applicant's approach to resolving the technical issues. During an audit in October 2010, the staff noted that the applicant had made a change to the methodology for determining steam dryer loads. Because of this change, the staff had to conduct another audit in December 2010. At this audit, the staff reviewed the draft report of the Comprehensive Vibration Assessment Program, the methodology to predict dryer load, the development of limit curves for use during the initial test, and additional analyses prepared for the dryer and nondryer components.

### *Spent Fuel Pool Criticality (Chapter 9)*

The application did not address several COL information items that require a fuel storage criticality and structural load drop analysis. The applicant maintained that existing ITAAC are sufficient to address those issues. The staff determined that the ITAAC do not adequately address the COL information items. The level of detail in the applicant's initial responses to staff RAIs fell short of staff expectations. An audit of the criticality analysis was conducted on December 8 and 9, 2010. After the audit, the applicant agreed to perform a bounding criticality analysis to address enrichment contents, burnup credit, and the use of gadolinium rods in the fuel pools.

### *Environmental Review*

The staff continues to prepare the FEIS. The FEIS is on track to be published in March 2011.

### *Advanced Boiling-Water Reactor Design Certification Rule Amendment*

Issuance of the STP COL depends on the completion of the ABWR DCR amendment. The staff is working on the rule in accordance with the schedule presented earlier.

### Schedule Status

#### Review Completion Dates

Original: FSER—September 2011  
FEIS—March 2011

Current: FSER—TBD  
FEIS—March 2011

## ABWR DESIGN CERTIFICATION RENEWAL

<b>Project</b>	<b>FSER</b>	<b>FEIS</b>	<b>Rulemaking</b>
Toshiba ABWR DC Renewal	TBD	TBD	TBD
GEH ABWR DC Renewal	TBD	TBD	TBD

### Toshiba ABWR Design Certification Renewal

#### General Information

Design: ABWR  
Application Type: DC renewal  
Location: N/A  
Docket Date: December 14, 2010

#### Project Risk

None

#### Schedule Status

On November 2, 2010, Toshiba tendered an ABWR DC renewal application. By letter dated December 14, 2010, the NRC informed Toshiba that the acceptance review for Toshiba's ABWR DC renewal application was complete and the staff had determined that the application is acceptable for docketing. The docket number established for the Toshiba ABWR DC renewal is 52-044. The staff is developing information for a technical review schedule.

### GEH ABWR Design Certification Renewal

#### General Information

Design: ABWR  
Application Type: DC renewal  
Location: N/A  
Docket Date: TBD

#### Project Risk

None

## Schedule Status

On December 8, 2010, GEH tendered an ABWR DC renewal application. The staff is performing an acceptance review and developing information for a proposed technical review schedule.

### **US-EPR**

<b>Project</b>	<b>FSER</b>	<b>FEIS</b>	<b>Rulemaking</b>	<b>Comments</b>
US-EPR DC	TBD	N/A	TBD	Schedule to be revised by January 2011.
Calvert Cliffs, Unit 3	July 2012	February 2011		
Nine Mile Point, Unit 3	TBD	TBD		Suspended at the applicant's request.
Bell Bend	August 2012	March 2011		Schedule being revised based on site layout changes.
Callaway, Unit 2	TBD	TBD		Suspended at the applicant's request.

### **US-EPR Design Certification Application**

#### General Information

Design: US-EPR  
Application Type: DC  
Location: N/A  
Docket Date: February 25, 2008

#### Project Schedule Risks

##### *Digital Instrumentation and Control*

On May 13, 2010, the staff communicated to AREVA that it had completed the review of the digital instrumentation and control (DI&C) design with respect to communication independence and diversity and defense-in-depth. However, the staff could not approve this aspect of the design because AREVA had not provided sufficient information. On October 1, 2010, AREVA submitted Revision 3 of the closure plan addressing the staff's feedback on the closure plan regarding continuous connection between the nonsafety service unit and safety division. Based on the staff's feedback, AREVA no longer intends to pursue continuous, bidirectional connection of the service unit. AREVA provided a final closure plan scope letter on November 23, 2010, and has committed to submitting all necessary technical information in March 2011. The staff will evaluate the impacts to the overall review schedule after AREVA has completed its design change documentation according to the closure plan.

### *Resolution of Generic Safety Issue 191*

The analysis and testing supporting the adequacy of the sump design do not adequately address key technical topics such as downstream effects and do not contain a complete evaluation of sump performance that considers additional sump strainer testing performed in July and August 2010. AREVA did not meet its commitment to provide a revision to the technical report by October 22, 2010. AREVA provided an incomplete revision to the technical report on November 5, 2010. AREVA did not meet its commitment to provide a path forward strategy by the end of October but did provide a detailed path forward on December 14, 2010. AREVA has committed to providing all technical information regarding Generic Safety Issue 191, "Assessment of Debris Accumulation on PWR Sump Performance," with the exception of in-vessel downstream effects testing, on the docket by March 31, 2011. For in-vessel downstream effects, AREVA will pursue the use of a COL information item.

#### *Next Step*

The NRC staff will hold a public meeting with AREVA in mid-January 2011, to discuss AREVA's proposed path forward.

#### *Seismic and Structural Design*

AREVA has changed its analytical methodology to complete the seismic and structural design. On April 26–30, 2010, the staff conducted an audit of Sections 3.7 and 3.8 (seismic and structural design) of the US-EPR DC FSAR. The audit identified many problems with the modeling and reanalysis that the applicant had performed. A path forward was identified for approximately 40 items that require analyses and calculations to be redone to resolve NRC technical concerns with the design. As a followup to this audit, the NRC conducted public meetings on June 9, 2010, and November 16, 2010, to discuss AREVA's new schedule for completion of this reanalysis work and to finalize the associated RAI responses. AREVA will provide most of the technical information needed to establish the licensing basis in order to complete the staff's Phase 2 review in January and February 2011. The current review schedule was based on receiving this information by June 30, 2010. As a result of this delay, the staff has revised its completion schedule from December 21, 2010, to August 12, 2011. The staff will decide on the viability of the new Phase 2 review schedule in March 2011 or sooner if AREVA further delays its RAI response schedule.

#### Schedule Status—Safety Review

Review Completion Date:

Original: FSER—May 2011

Current:

August 2012

## Calvert Cliffs Combined License Application

### General Information

Design: US-EPR  
Application Type: RCOL  
Location: Lusby, MD  
Docket Date: January 25, 2008 (Part 1), and June 3, 2008 (Part 2)

### Project Schedule Risks

#### *Organizational and Financial Information*

On November 3, 2010, Calvert Cliffs 3 Nuclear Projects, LLC, made a filing with the Atomic Safety and Licensing Board stating that Electricite de France (EDF) had acquired Constellation's interest in UniStar. A Schedule 13D filing on November 4, 2010, with the U.S. Securities and Exchange Commission confirmed this transaction. Based on this information, the NRC staff has issued an RAI asking the applicant to explain how UniStar complies with the requirements of 10 CFR 50.38, "Ineligibility of Certain Applicants." The applicant has committed to responding to this RAI by January 31, 2011. The schedule for the responses to the RAIs impacts the financial review of the COL application scheduled for completion on January 3, 2011.

#### *Seismic Information*

UniStar's package, containing the seismic information required for the review of FSAR Section 3.7, was submitted on December 29, 2009. The applicant intends to revise this section of the FSAR again to incorporate AREVA's results of the reanalysis conducted in response to a change in the dynamic model for the nuclear island. The applicant currently projects that it will submit its updated FSAR section by March 31, 2011.

The supplementary package containing the seismic information is currently in review. Based on the applicant's responses to these RAIs, the staff may plan an audit later this year to review the associated supporting documentation.

#### *Environmental Review*

The staff issued the DEIS on April 16, 2010. The DEIS includes a summary of the applicant's draft wetland and stream mitigation plan in an appendix. The applicant submitted the draft final mitigation plan on November 2, 2010, and USACE is currently reviewing the plan. The final mitigation plan is also needed in order to complete ESA consultations with USFWS. The NRC and USACE staffs are finalizing the documentation for consultation. The final plan summary and ESA consultation correspondence must be included in the FEIS to support USACE permitting requirements. In addition to the wetland and stream mitigation plan, USACE also needs to resolve the following issues with UniStar for the FEIS: responses to comments received in response to USACE's public notice, air conformity determination language for the USACE analysis, determination of tidal mitigation conditions in consultation with the National Marine Fisheries Service, and cultural resource consultation and analysis with regard to the

outfall location change and new dredging location. If USACE and UniStar are unable to resolve outstanding issues on the mitigation plan in a timely manner, the FEIS schedule may need to change. The staff continues work to finalize the FEIS and ESA consultation documentation.

### Schedule Status

#### Review Completion Dates

Original: SER—August 2011  
DEIS—February 2009  
FEIS—April 2010

Current: SER—July 2012  
DEIS—April 2010  
FEIS—February 2011

## **Nine Mile Point 3 Combined License Application**

### General Information

Design: US-EPR  
Application Type: SCOL  
Location: Oswego, NY  
Docket Date: December 12, 2008

### Status

On December 1, 2009, UniStar submitted a letter requesting that the NRC temporarily suspend the Nine Mile Point Unit 3 nuclear power plant (NMP3NPP) COL application review, including any supporting reviews by external agencies, until further notice. The staff prepared a response letter to UniStar, dated March 26, 2010, informing UniStar of the agency's plans to discontinue all activities on the NMP3NPP COL application review in an orderly manner and to preserve the work that has been accomplished.

On December 9, 2010, UniStar requested an exemption from 10 CFR 50.71(e)(3)(iii), and proposed delaying their submittal until December 31, 2012. NRC staff is currently processing this exemption request.

## **Bell Bend Combined License Application**

### General Information

Design: US-EPR  
Application Type: SCOL  
Location: Luzerne County, PA  
Docket Date: December 19, 2008

## Project Schedule Risks

### *Site Layout*

The applicant proposed site layout changes to reduce impacts to “exceptional value” wetlands to satisfy USACE’s need for a Section 404 permit under the Clean Water Act. These wetland avoidance issues for Bell Bend require the applicant to move the power block to avoid the currently impacted wetlands. Several technical areas will be receiving revised information to address the power block move. The agency received an updated submittal schedule from the applicant on July 16, 2010. The staff will need to revisit large portions of the geology, seismic design, and the hydrology reviews based on the revised submittals. The agency is currently receiving revised portions of the application. The full scope of the changes is currently projected for submission by July 2011.

### *Water Storage*

The Susquehanna River Basin Commission (SRBC) issues permits for water withdrawal from the Susquehanna River. The SRBC has informed the applicant that it does not intend to approve water withdrawal during low-flow periods unless there is low-flow augmentation (water storage). The impact of this decision could be significant, depending on the applicant’s decision on water storage. The EIS will need to evaluate impacts of proposed water storage and alternatives (flooding abandoned mines, building a reservoir, etc.). The applicant is developing its options and communicating with the SRBC. The PPL Corporation and the SRBC are developing a memorandum of understanding (MOU) on a basin-wide approach to low-flow augmentation; this MOU is projected to be in place in early 2011. The staff is waiting for the applicant to submit the results of the Instream Flow Incremental Methodology study to SRBC in February 2011 and for finalization of the MOU in early 2011.

USACE and EPA have concerns about PPL’s alternative sites analysis. USACE is requesting a detailed description of environmental impacts at all candidate sites in order to inform its LEDPA decision. The staff is waiting for the applicant to respond to the USACE and EPA concerns as part of the Joint Permit Application planned for submittal to USACE and the Pennsylvania EPA in March 2011. The Joint Permit Application includes the Clean Water Act Section 404 application.

### Schedule Status—Environmental Review

FEIS issue date: August 2011 (Schedule to be revised upon receipt of sufficient information regarding site layout changes.)

## **Callaway Plant Unit 2 Combined License Application**

### **General Information**

Design: US-EPR  
Application Type: SCOL  
Location: Callaway County, MO  
Docket Date: December 12, 2008

### **Status**

The technical reviews on this application are currently suspended. All schedules issued by letter dated May 26, 2009, will be reevaluated if and when AmerenUE requests resumption of reviews.

In a letter dated November 22, 2010, Ameren Missouri, a subsidiary of Ameren Corporation, notified the NRC that it now anticipates that an ESP application will be submitted in the second half of 2011. Union Electric Company d/b/a Ameren Missouri would be the applicant and license holder. Ameren stated that it would keep the NRC informed of its progress and any changes to this schedule. In the letter, Ameren stated that it intends to maintain the present COL application as a suspended application and plans to provide further correspondence on any future direction related to its status.

### **US-APWR**

<b>Project</b>	<b>FSER</b>	<b>FEIS</b>	<b>Rulemaking</b>
US-APWR DC	September 2011	N/A	TBD
Comanche Peak, Units 3 and 4	December 2011	May 2011	N/A
North Anna Unit 3	TBD	TBD	N/A

### **US-APWR Standard Design Certification**

#### **General Information**

Design: US-APWR  
Application Type: DC  
Location: N/A  
Docket Date: February 29, 2008

#### **Project Schedule Risks**

##### *Digital Instrumentation and Control Issues*

Mitsubishi Heavy Industries, Ltd. (MHI) has been implementing a plan since August 2009 to address DI&C issues in the areas of software program manuals, communications

independence, and quality assurance (QA). MHI submitted technical reports in these areas, which the staff has reviewed. The NRC's review found that significant concerns still exist that may require design changes. The NRC conducted a public meeting with MHI in late July and August 2010 to discuss these key technical issues related to the review of the DI&C design. MHI submitted a closure plan on August 27, 2010, for the US-APWR instrumentation and control open issues to address the NRC's concerns. On September 30, 2010, MHI also submitted additional documents addressing the NRC comments. The NRC issued a letter on September 28, 2010, documenting its key issues along with feedback on the MHI closure plan. On October 13, 2010, MHI submitted to the NRC all of the documents identified in its closure plan to address all deficiencies. The NRC staff determined that the revised software program manuals did not resolve the deficiencies. At a December 10, 2010, public meeting, the NRC staff discussed the issue with MHI. In that meeting, MHI stated that it plans to submit the revised software program manuals by January 31, 2011. The staff will assess the revised manuals and establish a new topical report and Chapter 7 review schedule for all the recently submitted DI&C documents.

### *Structure Design Changes*

MHI made structural changes to its design which required a new seismic analysis. MHI also changed the soil-structure interaction seismic analysis methodology for all safety-related structures from a soil-spring approach to a finite-element approach. This new analysis, now complete, is based on revised input parameters, such as ground motion time histories, finite-element models, and damping values that differ from the current DCD. The results of this seismic reanalysis impact the design of all structures, piping, equipment, and components. MHI has submitted the new seismic reanalysis technical reports, and they are under review. MHI has also submitted a revision to the methodology report, which requires additional staff review. The staff identified three additional reports needed to resolve the issue of "Category II over Category I." MHI has committed to submitting these seismic analysis summary reports for the turbine building, auxiliary building, and the access control building by January 2011. This task is currently the critical path for Phase 2. The NRC is awaiting RAI responses on the seismic reanalysis results, has additional RAIs to issue, and is also waiting for the submittals planned for January 2011. The NRC will establish a new Chapter 3 review schedule which includes time to review the January 2011 document submissions.

### *Loss-of-Coolant Accident Analysis*

The NRC has not previously approved the computer codes (M-RELAP5 and MARVEL-M) used by MHI for performing the small break loss-of-coolant accident (SBLOCA) analysis and the Non-LOCA accident analysis. The staff is currently performing these necessary computer code reviews in support of the SBLOCA Methodology and Non-LOCA Methodology topical reports and Chapter 15 of the applicant's FSER, "Transient and Accident Analyses." MHI submitted all the expected SBLOCA revised information (i.e., SBLOCA topical report, SBLOCA technical report, Scaling Analysis report, and DCD mark-up of section 15.6.5) on schedule in November 2010. The NRC has completed its review of this SBLOCA revised information referenced above. For the Non-LOCA topical report, the staff is expecting RAI responses in support of the review by February 6, 2011. The large-break LOCA review requires additional computational fluid dynamics submission outputs from the advanced accumulator; these are expected by

January 31, 2011. The NRC will establish a new review schedule for the topical reports and Chapter 15.

### *Sump Design*

MHI completed the sump head loss testing in June 2010 and has completed the in-vessel downstream effects testing (also known as core inlet blockage testing). Based on the test results, MHI is determining the best sump design and net positive suction head and will present its design approach to the NRC. The NRC staff is reviewing the sump strainer performance technical report and the core inlet blockage test technical report. The staff will establish a new review schedule to accommodate review of the reports and RAI responses, which are due to the NRC by January 31, 2011.

### *Nucleate Boiling Thermal-Hydraulic Testing*

MHI conducted departure from nucleate boiling thermal-hydraulic testing of the reactor fuel in August–September 2010 and in October–November 2010. Staff observed the testing in Germany. MHI submitted preliminary test results to the NRC in October 2010 and will submit the final test report on departure from nucleate boiling in February 2011. The staff is reviewing the preliminary test results and will review the results report when it is submitted.

### Schedule Status—Safety Review

Phase 6 FSER Completion Date:

Original: September 2011      Current: September 2011

## **Comanche Peak Combined License Application**

### General Information

Design: US-APWR  
Application Type: RCOL  
Location: Somervell County, TX  
Docket Date: December 2, 2008

### Project Schedule Risks

#### RCOL Review Schedule

The NRC staff will evaluate any changes to the DC schedule to determine if they have an impact on the RCOL schedule.

#### *Ground Water Model (FSAR, Chapter 2.4)*

The applicant's radionuclide source term characterization in Section 2.4.13 is an issue of concern due to unresolved issues related to Chapter 11 of both the US-APWR DCD and the COL application. Staff is working to resolve the source term characterization and proceeding

with independent confirmatory analysis for Section 2.4.13. Development of the SER with open items is in progress and tentatively scheduled for completion by March 1, 2011, dependent on the resolution of source term issues.

#### *Administrative and Financial Information*

The staff has determined that the applicant did not provide sufficient information in Part 1, "Administrative and Financial Information," of the application. Specifically, the applicant did not (1) address the formation of Comanche Peak Nuclear Power Company (CPNPC), formerly Nuclear Project Company LLC, a newly formed entity formed to construct and operate Comanche Peak Nuclear Power Plant Units 3 and 4 (CPNPP Units 3 and 4), (2) provide a negotiation action plan for MHI's 12 percent ownership of CPNPC, (3) provide all of the information required in 10 CFR 50.33(a) through 10 CFR 50.33(d) for all MHI entities (e.g., subsidiaries) that will be involved directly or indirectly in the licensing action for CPNPP Units 3 and 4 as a result of the formation of the joint venture with Luminant and MHI, (4) discuss the conditions and terms of Luminant's plan to obtain debt financing, provide the financial cost of the facility in the format referenced in Appendix C, "A Guide for the Financial Data and Related Information Required To Establish Financial Qualifications for Construction Permits and Combined Licenses," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," and describe sources of construction funding, and (5) provide a statement describing the bases for the derivation of the construction cost estimates for CPNPP Units 3 and 4.

On August 31, 2009, and January 27, 2010, Luminant responded to the NRC staff's RAIs. The staff issued followup RAIs on March 9, 2010, and discussed these RAIs during a May 18, 2010, proprietary meeting. Luminant responded to these RAIs on June 11, 2010. The NRC staff found that the applicant's responses did not include an operating service agreement and provided an inadequate negotiation of foreign ownership. Luminant submitted its operating service agreement on September 1, 2010. The NRC staff issued an RAI concerning the negotiation of foreign ownership on October 14, 2010.

#### *Next Steps*

The staff is reviewing the operating service agreement. The staff will evaluate the RAI response when Luminant submits it.

#### *Environmental Reviews:*

The public comment period for the DEIS ended on October 27, 2010. The staff is currently editing the EIS to address comments received that were in scope.

#### Schedule Status

Review completion dates:

Original:	FSER—December 2011	Current:	FSER—December 2011
Original:	FEIS—January 2011	Current:	FEIS—May 2011

## North Anna 3 Combined License Application

### General Information

Design: US-APWR  
Application Type: SCOL  
Location: Mineral, VA  
Docket Date: January 28, 2008

### Project Schedule Risks

#### *Technology Change*

The applicant decided to switch from ESBWR to US-APWR technology. The staff is developing a new review schedule to accommodate the new technology for the North Anna 3 application.

### Schedule Status

The staff has conducted its preliminary assessment of the COL application revisions and is in the process of establishing a revised schedule. The staff is revising the review schedules for the US-APWR DCD and Comanche Peak (reference COL application) to facilitate the reviews of recent submittals. The staff will establish the North Anna 3 schedule after the review schedule changes are final for the DCD and RCOLA. The environmental staff will be supplementing the EIS that was completed in February 2010 based on the ESBWR design.

The staff is proceeding with various aspects of the environmental review under an internal schedule and expects to complete the publication of a supplemental EIS to NUREG-1917, "Supplemental Environmental Impact Statement for the Combined License (COL) for North Anna Power Station Unit 3—Draft Report for Comment," issued December 2008, in the third quarter of FY 2012. The staff will develop and publish a final schedule once it has had an opportunity to assess the impacts of the changes in the DC review on the overall project.

### EARLY SITE PERMIT

Project	FSER	FEIS	Rulemaking
Victoria	April 2013	August 2013	N/A
PSEG	July 2013	March 2013	N/A

## Victoria County Station Early Site Permit Application

### General Information

Design: Plant parameter envelope approach  
(no design specified at this time)  
Application Type: ESP  
Location: Victoria, TX  
Docket Date: N/A  
Review Completion Date: June 7, 2010

### Project Risks

None

### Schedule Status

On August 31, 2010, the NRC issued a schedule letter to Exelon Nuclear Texas Holdings, LLC (Exelon), for the review of the Victoria County Station ESP application. The safety and environmental reviews began on October 1, 2010.

The *Federal Register* Notice for environmental scoping was published on November 2, 2010, with the scoping period closing on January 3, 2011. Public scoping meetings were held December 2, 2010, in Victoria, TX. The notice of opportunity to petition for leave to intervene was published in the *Federal Register* on November 23, 2010. The 60-day period to file a contention ends on January 24, 2011.

Review Completion Dates:  
Current Safety Phase A Completion Date: October 2011  
Current Environmental Phase 1 Completion Date: July 2011

## Public Service Enterprise Group Incorporated Early Site Permit Application

### General Information

Design: Plant parameter envelope approach  
(no design specified at this time)  
Application Type: ESP  
Location: Public Service Enterprise Group Incorporated (PSEG) site  
(adjacent to Salem and Hope Creek Generating Stations site),  
Salem County, NJ  
Docket Date: August 4, 2010 (the docket number established is 52-043; *Federal Register* notice (75 FR 49539) on docketing was published on August 13, 2010)

### Schedule Status

The NRC issued the review schedule letter to PSEG on November 29, 2010.

## Project Risks

TBD

## Schedule Status

TBD

## **OTHER LICENSING ACTIVITIES**

### Expected New Applications Identified During the First Quarter FY 2011

The NRC has not received any letters of intent regarding potential applications during this period.

### Other Licensing Activities

On March 23, 2010, STP submitted a revised exemption request for the installation of crane foundation retaining walls. The staff reviewed the request for exemption to authorize the installation of crane foundation retaining walls in Units 3 and 4. The staff issued the exemption on November 5, 2010.

Review schedules and other pertinent information are available on the public Web page at <http://www.nrc.gov/reactors/new-reactors.html>.

## **LICENSING SUPPORT**

### Licensing Activities

#### *Application Review Process*

The staff continues to perform activities to enhance the effectiveness and efficiency of the review processes for new reactor applications. These activities include updating key guidance documents for NRC activities and application preparation, developing strategies and work products for optimizing the review of applications received, developing a construction inspection program for new construction activities, and continuing activities in the preapplication and DC review processes.

#### *Issue Management*

Issues currently under evaluation include the following:

- review of the design change processes during construction
- form and content of Commission paper to support COL mandatory hearing
- standardized approach to license conditions

- review of construction impacts on existing units
- DC amendment and renewal processes and standards

## Guidance Activities

### *Regulatory Guides*

The Web site for the Office of Nuclear Regulatory Research (RES) describes its program to update the NRC's regulatory guides (RGs). The Web site also identifies those RGs for which NRO is the lead office in the preparation of the update. During the first quarter of FY 2011, NRO reviewed 12 draft and final RGs in preparation for their issuance for public comment, for final issuance, or for withdrawal. No RGs, for which NRO is the lead office, were issued as final guides in the first quarter.

Additionally, NRO updated Draft Guide (DG)-4016 (proposed Revision 2 to RG 4.11, "Terrestrial Environmental Studies for Nuclear Power Stations") in preparation for public comments. At the request of the author, the proposed revision was presented to the ACRS before its submission to the *Federal Register*. In a letter dated March 25, 2010, the ACRS made recommendations that should be addressed before the RG is published. The staff is incorporating the comments, and the RG will be published in the *Federal Register* the second quarter of FY 2011.

NRO also updated draft Regulatory Guide, DG-1253, "Preoperational Testing of Emergency Core Cooling Systems for Pressurized Water Reactors," a proposed Revision 2 to Regulatory Guide 1.79 and is expects to publish for the RG for public comment in the second quarter of FY 2011.

### *Interim Staff Guidance*

Interim staff guidance (ISG) documents serve as temporary sources of guidance for NRC staff during licensing reviews. These documents are also an important reference for applicants and licensees to help them understand staff expectations. The information contained in ISGs is incorporated into other permanent NRC documents, such as RGs and standard review plans (SRPs), when they are periodically updated. ISGs issued by NRO are available to the public on the NRC Web site. The NRC expects to issue DC/COL-ISG-022, "Interim Staff Guidance on Impact of Construction on New Nuclear Power Plants on Operating Units and at Multi-Unit Sites," for comment in the second quarter of FY 2011.

### *Standard Review Plan*

NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition" (also known as the SRP), is the primary review document for the staff to use in reviewing and evaluating proposed licensing actions for nuclear power plants. It contains guidelines to ensure that staff evaluations lead to clear and defensible findings that demonstrate that the health and safety of the public will be maintained.

The SRP contains approximately 250 sections covering the entire scope of a nuclear power plant. Updating the SRP and other associated guidance documents is critical to ensuring that staff evaluations reflect the latest information and knowledge related to the safe operation of

nuclear power plants. The comprehensive SRP review and update program occurs on a 4-year cycle. It involves a review of all sections of the SRP to determine which sections require an update and to budget and schedule the resources necessary to perform the updates. Some SRP updates must be completed in shorter timeframes than those supported by the review and update program. The staff issued final guidance to four SRP sections related to Physical Security Rule change in the final quarter of FY 2010. To support its developmental work in the area of DI&C, the staff issued three proposed SRP updates for public comment in the first quarter of FY 2011.

## Rulemaking Activities

### *Aircraft Impact Assessment Rulemaking*

The NRC published the final rulemaking on AIA in the *Federal Register* on June 12, 2009 (74 FR 28111), which became effective on July 13, 2009. The rule, at 10 CFR 50.150, "Aircraft Impact Assessment," requires applicants for licenses for new nuclear power reactors to perform a design-specific assessment of the effects of the impact of a large commercial aircraft. The rule requires applicants to use realistic analyses to identify and incorporate design features and functional capabilities to show that either the reactor core remains cooled or the containment remains intact, and either spent fuel cooling or spent fuel pool integrity is maintained, with reduced reliance on operator actions. The staff endorsed industry guidance on the methodology for performing AIAs for new plant designs in July 2009 in DG-1176, "Guidance for the Assessment of Beyond-Design-Basis Aircraft Impacts." Information to comply with the rule has been submitted for all design centers currently under NRC review, and the staff is reviewing the submittals. Reviews of the ESBWR design and the amended ABWR and AP1000 designs are complete, and reviews of the US-EPR and US-APWR are underway.

In the first quarter of FY 2011, the staff issued the FSER on the AIA DC amendment for the STP ABWR, submitted the associated proposed rule to the Commission, and received Commission approval to publish the proposed rule for public comment. The staff also issued the inspection report for the AIA inspections of the ESBWR and AP1000 designs and resolved all issues related to the associated NOVs. Finally, the staff met with the ACRS on the AIA review and inspection for both the ESBWR and AP1000 designs.

### *10 CFR Part 21 Rulemaking*

The staff identified several areas within 10 CFR Part 21, "Reporting of Defects and Noncompliance," that could be enhanced through rulemaking. NRO is collaborating with the Office of Nuclear Reactor Regulation, the Office of Federal and State Materials and Environmental Management Program, the Office of Nuclear Material Safety and Safeguards, and the Office of the General Counsel to identify all areas to be considered for the rulemaking and to develop the regulatory basis for this rulemaking. NRO is planning to begin work on a regulatory basis for this rulemaking in FY 2012.

### *10 CFR Part 52 Licensing Lessons-Learned Rulemaking*

The staff has identified a number of improvements to 10 CFR Part 52 as a result of lessons learned during its review of DC and COL applications. NRO is planning to begin work on a proposed rule in FY 2012.

### *Access Authorization and Physical Protection Requirements for Nuclear Power Plant Construction Rulemaking*

NRO prepared a proposed rulemaking to add provisions that would apply during the reactor construction phase. The new provisions would require: (1) physical protection measures; (2) access authorization controls; (3) physical inspections; (4) performance of high-quality security sweeps; and (5) lockdown measures and procedures for securing the security- and safety-related structures, systems, and components before entering the operational phase. The staff held public workshops on March 31, 2010, and August 27, 2010, to discuss the text of the draft proposed rule. The staff delivered the proposed rule to the Commission on October 21, 2010. The NRC staff plans to publish draft regulatory guide DG-5037, "Access Authorization and Physical Projection During Nuclear Power Plant Construction," for public comment in conjunction with the publication of the proposed rule.

### *ITAAC Rulemaking Maintenance*

In July 2010, the staff received Revision 4 to NEI 08-01, "Industry Guideline for the ITAAC Closure Process Under 10 CFR Part 52," for licensees on the requirements for ITAAC closure. The revised industry guideline was revised to add critical sections of ITAAC maintenance. The ITAAC maintenance period covers the time from when the licensee submits an ITAAC closure letter to the time the Commission authorizes the facility to operate. The Commission is currently reviewing SECY-10-0117, "Proposed Rule: Requirements for Maintenance of Inspection, Tests, Analyses, and Acceptance Criteria," dated August 30, 2010, which contains the proposed provisions for ITAAC maintenance. If the Commission approves the proposed rule, the staff will issue it for public comment, as well as the draft revision of RG 1.215, "Guidance for ITAAC Closure Under 10 CFR Part 52." The draft RG 1.215 will address Revision 4 of NEI 08-01 and provide endorsement, as appropriate. The issuance of the draft RG revision will coincide with the publishing of the proposed rule, expected in early 2011. The proposed rule will update the language of 10 CFR 52.99 to include ITAAC maintenance and new reporting requirements.

### *Design Certification with Multiple Vendors*

NRO has been discussing plans for addressing industry activities related to the ABWR DC. Two parties have submitted renewals for the ABWR DC. In addition, STP submitted an application for amendment to the ABWR DC to comply with the AIA rule in June 2009. The staff has issued the FSER on the STP ABWR AIA design certification amendment and submitted the associated proposed rule to the Commission. The staff requested Commission approval of its proposal to address the treatment of multiple suppliers for a single design in the proposed rulemaking on the STP amendment sent to the Commission for review in October 2010. On December 14, 2010, the Commission approved publication of the ABWR amendment proposed rule and approved the staff's recommendation for the treatment of DCs with multiple suppliers. The proposed rule, which seeks public comment on the staff's recommendation, is expected to

be published in the *Federal Register* by the end of January 2011. The Commission approved publication of the proposed rule that will amend Appendix A to 10 CFR Part 52 so that applicants or licensees intending to construct and operate an ABWR in the United States may comply with the AIA rule by referencing the amended design. The next step is to publish the proposed rule.

## **CONSTRUCTION INSPECTION ACTIVITIES**

### **Construction Inspection Program**

Construction is underway and the NRC has begun executing construction inspection activities associated with the Vogtle LWA. Infrastructure is in place to support FY 2011 inspection activities to verify quality construction. On March 8, 2010, safety-related construction officially began at VEGP Unit 3 with the start of engineered backfill operations authorized under the LWA. Safety-related activities have also begun for Unit 4. NRC Region II construction inspectors were present to observe the licensee's initial activities and to begin the first onsite ITAAC inspection. Region II has selected the construction senior resident inspector and resident inspector for VEGP and opened the resident office on August 16, 2010. In November 2010, Region II conducted a second inspection, in accordance with Inspection Procedure 35007, "Quality Assurance Program Implementation during Construction"; this inspection examined those portions of the QA program associated with LWA activities. The assessment process under Inspection Manual Chapter (IMC) 2505, "Periodic Assessment of Construction Inspection Program Results," that started on July 1, 2010, was used to complete the first quarterly assessment in November 2010. The next construction milestone—backfill reaches the bottom of the nuclear island—was reached in late November 2010. Region II conducted an ITAAC inspection associated with the backfill in December 2010.

### **ITAAC**

The staff continues to refine concepts for ITAAC closure and maintenance of closed ITAAC. The staff conducted many public meetings within the past year to provide a forum for stakeholders to participate in and comment on staff proposals for ITAAC closure, ITAAC maintenance, and other construction inspection program issues. In July 2010, the staff received Revision 4 of NEI 08-01, which provides guidance for 10 CFR Part 52 applicants and licensees on the requirements of the ITAAC closure process. The industry guideline was revised to add critical sections of ITAAC maintenance, which had been vetted through public ITAAC workshops. The ITAAC maintenance period covers the time from when the licensee submits an ITAAC closure letter to the time the Commission authorizes the facility to operate. Using Revision 4 of NEI 08-01 as the current reference point, the staff is revising RG 1.215, which endorses the industry guide. The staff plans to issue the draft revision to RG 1.215 for public comment shortly after the publication of the proposed 10 CFR Part 52 rulemaking on ITAAC maintenance, expected in early 2011. SECY-10-0117, "Proposed Rule: Requirements for Maintenance of Inspection, Tests, Analyses, and Acceptance Criteria," dated August 30, 2010, contains the proposed provisions for ITAAC maintenance. The staff briefed the Commissioners' Technical Assistants on the rulemaking on December 15, 2010.

The staff is participating in the simulated ITAAC closure and verification demonstration exercise described in SECY-10-0100, "Staff Progress in Resolving Issues Associated with Inspections,

Tests, Analyses, and Acceptance Criteria,” dated August 5, 2010. The exercise, sponsored by the U.S. Department of Energy (DOE), simulates licensee closure and submittal of six ITAAC examples from the Westinghouse AP1000 design. SNC and Westinghouse are participating as industry representatives and have finished the first stage of the demonstration by simulating the performance of ITAAC and submitting 10 CFR 52.99(c)(1) notifications for the selected ITAAC. The first stage also included the staff’s performance of a simulated inspection of the completed ITAAC. The exercise is currently in its second stage, which involves staff verification of the submitted notifications. The staff will verify closure through the process proposed in SECY-10-0100. As part of the exercise, Westinghouse is also evaluating the surge in ITAAC closure submittals expected during the last year of construction of a new nuclear power plant and has offered some insights into how the surge may be reduced to limit the resource impact on staff. The exercise is expected to conclude by the end of March 2011 and will include a lessons-learned report.

Training sessions were conducted for NRO technical reviewers and inspection program staff in 2010, to complement the guidance provided in both Regulatory Issue Summary 2008-05, “Lessons Learned to Improve Inspections, Tests, Analyses, and Acceptance Criteria Submittal,” dated February 27, 2008, and its revision, dated September 23, 2010. The staff has developed a video of this training and made it available through the EPM SharePoint ITAAC Closure and DAC [Design Acceptance Criteria] Resolution home page for continued use. The training session summarizes the lessons learned and discusses specific examples of the best practices associated with the quality, clarity, and inspectability of ITAAC submitted as part of the applications for ESPs, standard DCs, or COLs.

The DAC working group was formed in November 2009 to respond to an STP request for review of DI&C DAC products related to the design of STP Units 3 and 4. Efforts have been focused on developing a viable DAC inspection process. Elements include developing a process framework in parallel with developing DAC inspection procedures (DI&C documents have priority, but piping and human factors strategies are also being developed). In October 2010, the staff briefed the ACRS on DAC and the DAC inspection process. The staff completed the draft DI&C DAC inspection procedure in December 2010 and submitted it to the ACRS for review. In February 2011, Region II, with support from NRO, plans to conduct the second DAC ITAAC inspection of the STP DI&C. Additional inspections of STP DI&C DAC activities are expected in 2011 and beyond. Concurrent with these efforts, an integration plan is being developed which will expand the working group charter, incorporate elements of the STP initiative into a generic DAC inspection methodology, and set the stage for revisions to RG 1.215.

#### Construction Reactor Oversight Process

The Commission directed the staff to form the Construction Reactor Oversight Process (cROP) working group in December 2009 to develop construction assessment program options for Commission consideration. Development efforts have focused on the inclusion in the cROP of objective elements such as construction program performance indicators and significance determination processes analogous to those used in the Reactor Oversight Process. The working group has developed a regulatory framework, including strategic performance areas and cornerstones and objectives, attributes, and areas to measure. In October 2010, the working group completed its initial staff proposal and forwarded it to the Commission via

SECY paper 10-0140, "Options for Revising the Construction Reactor Oversight Process Assessment Program." On December 16, 2010, the staff briefed the Commission on its proposals for revising the cROP.

#### Quality Assurance and Vendor Inspections

On December 2010, NRO staff sponsored a project kickoff meeting for the Counterfeit, Fraudulent, and Suspect Items (CFSI) agencywide initiative. Commitment to the initiative came in response to the 2010 Office of the Inspector General audit of the NRO Quality and Vendor Inspection Program. Representatives from the various stakeholder offices, as well as members of the CFSI Executive Steering Committee, attended the meeting. The meeting addressed the historical aspects of the agency's involvement with CFSI during the 1980s and 1990s, as well as current initiatives of other government agencies and industry sectors. Also discussed was the need to understand the current regulatory basis applicable to the prevention of CFSI for all agency programs. The presentation emphasized the next steps, which include completing the participant surveys, establishing appropriate working groups, and drafting a charter. Additionally, NRO staff along with a member of the NRC's CFSI steering committee attended the DC Counterfeit Microelectronics working group at the U.S. Attorney's Office for the District of Columbia. The staff will be following the government initiatives in this area and will continue to evaluate their applicability to the nuclear industry.

During the fourth quarter the staff conducted one vendor inspection and one QA implementation inspection.

### **ADVANCED REACTORS**

The staff has undertaken a variety of activities to prepare for applications for SMRs which may arrive as early as FY 2012. The staff has evaluated past advanced reactor experience and interacted with stakeholders to identify issues that need to be addressed to support design and licensing reviews of SMR designs and deployment. Although approached by vendors and advocates for a variety of reactor technologies, the NRC staff has focused its attention on the NGNP Program and on integral pressurized-water reactors (iPWRs).

#### Next Generation Nuclear Plants

The staff is currently working with DOE to coordinate various research and preapplication activities related to Phase 1 of the NGNP Program. The staff communicates often with DOE and the lead laboratory, Idaho National Laboratory (INL), regarding research and development activities, as well as the efforts to support the future licensing of the NGNP prototype and subsequent commercial units. The staff is currently reviewing white papers submitted by INL that address topics such as including the risk-informed, performance-based regulatory framework (e.g., defense in depth, licensing basis event selection, and safety classification and treatment of structures, systems, and components); high-temperature materials; fuel qualification; mechanistic source term; modular plant licensing; emergency planning; and safety classification for systems, structures, and components. These white papers are intended to serve as a basis for initial discussions between DOE and the NRC regarding the overall

approach and issues associated with each topic, informing the prospective designer of issues that should be addressed in a future licensing application.

The NRC staff has made presentations to the DOE Nuclear Energy Advisory Committee on the NGNP licensing framework and the NRC's preparations for reviewing the expected COL application. The Advisory Committee will make a recommendation to the Secretary of Energy in spring 2011 for Phase 2 of the NGNP program. The Secretary's decision regarding Phase 2, which involves specific design and licensing activities for a prototype reactor, is expected in fall 2011.

In addition to routine interactions with DOE/INL on major research and development efforts sponsored by DOE (e.g., fuels and materials testing programs), RES has activities underway to support the NGNP licensing program. The most significant of these NRC research activities involves the development of computer codes and models to support independent NRC evaluations of the behavior of high-temperature gas-cooled reactor (HTGR) systems.

### Integral Pressurized-Water Reactors

#### *NuScale Power, Inc.*

The NuScale modular reactor is a 160-megawatt-thermal (MWt) (45-megawatt-electric (MWe)), natural circulation pressurized-water reactor design that consists of an integrated reactor vessel assembly that includes the reactor core, pressurizer, control rods, and two helical steam generators, all located within the reactor vessel, which is submersed in a pool of water. NuScale is proposing that each plant be designed to accommodate up to 12 totally independent modules (reactor vessel and containment), for a total plant electrical capacity of up to 540 MWe.

The staff has been engaged in preapplication activities with NuScale since early 2008. NuScale informed the staff that it intends to file its formal request for DC in early 2012. In advance of its DC application, NuScale informed the NRC of its intent to submit 15 technical reports. The NRC has received reports on the LOCA phenomena identification and ranking table (PIRT) and human factors engineering (HFE) program management plan, cyber security plan, QA topical report, and the HFE implementation plan. The staff is currently reviewing the HFE, LOCA PIRT, and QA topical reports. The staff will prepare an SER for the QA topical report by March 2011. During this quarter, the staff met with NuScale personnel at their offices in Corvallis, OR, to discuss the status of the schedule, design activities, control room simulator, and Oregon State University test facility. On December 13, 2010, a public meeting was conducted in Rockville, MD, to receive a presentation and to discuss codes and standards that NuScale will be using in its thermal-hydraulic and core analyses.

#### *Babcock and Wilcox mPower<sup>TM</sup>*

The mPower reactor is a 400-MWt (125-MWe) light-water reactor that consists of a self-contained module with the reactor core, reactor coolant pumps, and steam generator located in a common reactor vessel installed in an underground containment. B&W is considering designing the standard plant for two modules.

The staff has been engaged in preapplication activities with B&W since mid-2009. In October 2010, B&W sent a letter to the NRC that detailed its plans to submit a total of 29 reports during preapplication before submittal of its DC application, expected in late FY 2012. The NRC has received technical reports on the following topics: QA plan for DC, plant design overview, critical heat flux test and correlation development plan, core nuclear design codes and methods qualification, integrated system test (facility description and test plan), instrument setpoint methodology, and control rod drive mechanism design and development. The staff is establishing review schedules and expectations for the feedback format for these reports. The staff held detailed technical meetings with B&W this quarter on the integrated system testing plan, instrumentation and controls architecture, and security design. The next meeting with B&W is scheduled for January 19, 2011, to discuss the core nuclear design codes and methods qualification.

### *Tennessee Valley Authority*

On December 14, 2010, the staff held a public meeting to discuss TVA's key assumptions letter for the possible licensing and construction of an SMR at the Clinch River site. TVA provided clarifying information in response to the staff's questions on the six key assumptions identified in TVA's November 5, 2010, letter to the NRC. Representatives from B&W and Bechtel also participated in the meeting, and members of the public and press attended as observers. TVA provided the staff with a revised assumptions letter on December 22, 2010, to clarify its intent for each key licensing assumption. The NRC staff will consider the meeting discussion, as well as the revised assumption letter, and prepare a response to TVA in early calendar year 2011.

### Other Reactor Technologies

The staff has occasional interactions with potential applicants using other advanced reactor designs, such as sodium-cooled fast reactors, lead-bismuth-cooled fast reactors, and fluoride salt-cooled high-temperature reactors. Staff activities related to these designs are limited to low-level efforts (e.g., knowledge management) and nonresource intensive interactions with vendors (e.g., occasional meetings). Although receiving occasional inquiries about the regulation of fusion-based energy devices, the staff, as directed in the SRM dated July 16, 2009, related to SECY-09-0064, "Regulation of Fusion-Based Power Generation Devices," dated April 20, 2009, is not pursuing licensing or infrastructure development related to fusion energy until commercial deployment of the technology is more predictable, as established by successful testing.

### Generic Policy Issues

The staff continues to focus on identifying and resolving policy and key technical issues, developing guidance, and participating in preapplication interactions related to various advanced reactor technologies and designs. The staff identified a number of generic issues for the Commission in SECY-10-0034, "Potential Policy, Licensing, and Key Technical Issues for Small Modular Nuclear Reactor Designs," dated March 28, 2010. The staff has developed specific resolution plans for the issues identified in SECY-10-0034 and is also working on many key technical issues associated with iPWRs and the NGNP Program. NRO staff is coordinating the resolution of these issues with other NRC offices and organizations. Within the last year, the industry has also formed groups to discuss and coordinate issues associated with SMRs.

NEI and the American Nuclear Society have established various working groups to develop position papers on many of the generic issues identified in SECY-10-0034. To ensure close coordination between the NRC and its stakeholders, as well as timely resolution of the issues, the NRC advanced reactor subprogram and NEI have established routine public meetings to

discuss generic approaches to resolving the policy, licensing, and key technical issues for the spectrum of advanced reactor technologies.

The staff committed in SECY-10-0034 to provide the Commission with periodic updates (via this quarterly report) on its development and implementation of issue resolution plans related to advanced reactors. The SRM dated August 31, 2010, "Use of Risk Insights to Enhance Safety Focus of Small Modular Reactor Reviews," also instructed the staff to provide an update on the issue resolution plans described in SECY-10-0034. An update on the staff's activities in this area is as follows:

- License Structure for Multimodule Facilities: One of the policy issues being assessed is the handling of multimodule facilities within the licensing processes and related safety and environmental reviews. NRO is working to develop one or more approaches that will be the subject of a Commission paper expected in 2011. Papers on this topic submitted by the NNGP Program and NEI will be considered in the development of the Commission paper. The configurations of multimodule facilities are also a topic within other issue resolution plans and will need to be addressed within the proposed approaches to resolve those broader issues. Examples include the need to address risk assessments for multimodule facilities, the handling of multimodule facilities in the NRC fee structure, and the requirements for liability and property insurance.
- Manufacturing License Requirements for Future Reactors: The staff and various stakeholders have raised questions about using the manufacturing license provisions in 10 CFR Part 52 for SMRs. The NRC has issued only one manufacturing license and it was for Offshore Power Systems floating nuclear plants in 1982. The first issue related to manufacturing licenses for SMRs is how the provisions could apply to a reduced scope, as compared to the total plant licensed in the case of Offshore Power Systems, and whether the industry is actually interested in using such provisions, assuming that clarifications or changes to the requirements are pursued. The staff has discussed this topic at several public meetings with the industry and will request additional information in a planned generic communication and during future meetings. Following these interactions, the staff will develop possible alternatives for Commission consideration and expects to provide a Commission paper by the fourth quarter of FY 2011
- Risk-Informed Licensing Approaches: The issue resolution plan for risk-informed licensing has been revised to address the recent SRM and the Commission's direction to develop a plan to apply risk insights to the licensing of iPWRs in order to improve the efficiency and safety focus of the staff's reviews. The staff is having internal meetings and has engaged the DOE national laboratories to develop possible approaches for applying risk insights into the design or licensing reviews for SMRs. This topic was also discussed at the periodic generic topics meeting held with the NEI working groups several weeks ago. As directed in the SRM, the staff will be developing a framework and design-specific review plans for the iPWRs and then applying the lessons from that

initiative, along with ongoing interactions with the NGNP Program, to the longer term goal of developing a broader risk-informed licensing structure. The issues described in SECY-10-0034 related to defense in depth, licensing basis event selection, and probabilistic risk assessments have been incorporated into the risk-informed licensing approach issue resolution plan.

- Appropriate Source Term, Dose Calculations, and Siting: The staff source term working group is continuing its review of a white paper submitted by the NGNP Program on the use of a mechanistic source term for HTGRs. The importance of modeling source terms and the relationship to issues such as emergency preparedness, have also been discussed in recent generic topics meetings with industry. The staff is awaiting additional information from iPWR vendors.
- Appropriate Requirements for Operator Staffing for Small or Multimodule Facilities: Given the relatively low power and multimodular nature of many advanced reactor designs, the staff is assessing the need for changes to the staffing requirements in 10 CFR 50.54(m). The staff has established a working group to focus on this issue and has developed an issue resolution plan that is being executed. In the near term, the staff is focusing on activities aimed at developing the technical basis and guidance to support review of submittals related to HFE and giving reviewers the tools to address exemption requests to 10 CFR 50.54(m) for the first round of anticipated SMR COL applications. NRO established a user need with RES for long-term rulemaking efforts and has additionally contracted with the DOE national laboratories to support development of regulatory guidance documents and training with both near-term and long-term deliverables. The staff is actively seeking stakeholder interaction by discussing this topic at regular SMR generic topic meetings, reviewing position papers from an American Nuclear Society special committee, and evaluating topical reports and white papers from potential vendors. The staff is developing input for a SECY paper intended for spring 2011 to clearly define the problem and inform the Commission of potential approaches to resolve the issue. The SECY paper would also request the Commission's view on proceeding with guidance and rulemaking that may result in reduced staffing requirements (compared to existing requirements) for some plant designs and configurations.
- Offsite Emergency Planning Requirements: The staff has recently completed a series of internal meetings which identified possible policy and key technical issues associated with emergency preparedness requirements for SMRs. Similar meetings will be held for other issues to ensure that the staff has identified issues and is able to prioritize SMR licensing activities. An NEI working group is also addressing emergency preparedness. The staff discussed this topic at several generic topics public meetings and is reviewing position papers along with other assessments from vendors, the NGNP Program, and other sources to develop possible approaches to establishing emergency preparedness requirements for SMRs. The staff is developing an emergency preparedness framework for SMRs for Commission consideration and expects to provide the Commission with a SECY paper describing a recommended option for the framework by the second quarter of FY 2011.

- Security and Safeguards Requirements: Similar to emergency preparedness, the staff is assessing various documents related to security and possible approaches for increasing the degree to which security concerns are addressed in plant designs. This is another topic that the staff will address during routine meetings with the SMR community and for which the staff will solicit position papers from NEI and more detailed information from vendors. The staff will inform the Commission and, if appropriate, seek Commission direction on the activities and approaches being pursued by the staff, vendors, and likely licensing applicants.
- NRC Annual Fees: The staff has assessed the public comments received in response to an advance notice of proposed rulemaking issued last year that sought views on possible changes to the current NRC annual fee structure to incorporate SMRs. An NEI task force has prepared an industry position paper on this topic and presented it to the NRC staff for consideration in its development of a possible variable fee structure for SMRs. The staff is currently assessing the industry position paper and will consider it, along with other factors, in developing an approach to be presented to the Commission in a paper in January 2011.
- Insurance and Liability Requirements: The staff is conducting internal meetings and has engaged the NEI working group to develop possible approaches to address SMR insurance and liability requirements. This topic was also discussed at the generic topics public meeting held in November 2010. NEI is preparing a position paper on this topic, which is expected to be submitted in early 2011. The staff intends to have alignment meetings with DOE and other stakeholders to evaluate the possible need for legislative and/or regulatory changes. A policy paper to the Commission is scheduled for the end of FY 2011.
- Decommissioning Funding Requirements: The staff's working group will assess an industry position paper submitted by NEI, which addresses issues such as the requirements for decommissioning funding for multimodule facilities. Following its review of the industry position paper, the staff will either (1) provide feedback to NEI if the proposed approach does not introduce major policy issues or (2) develop possible alternatives for Commission consideration if major policy issues are identified. The staff will complete its review of the industry position paper in early 2011.

#### Infrastructure Development

Focusing the attention of staff on the NGNP Program and on iPWRs continues to enhance the effectiveness and efficiency of other advanced reactor activities by doing the following:

- providing the information necessary to develop resource estimates for reviewing the designs for advanced reactors
- allowing the NRC technical review staff sufficient time to become familiar with advanced reactor design concepts
- providing feedback on key design, technology, safety research, and licensing issues

- identifying interrelated or cross-cutting regulatory safety issues and identifying reasonable resolution paths for these issues by determining the technical skills necessary to review these designs and, as appropriate, hiring staff and contractors with the requisite knowledge, skills, and abilities
- developing information technology tools and SharePoint infrastructure to allow for a more agile interaction with Project Managers and technical staff, as well as maintaining an inherent knowledge management capability to ensure consistency and enable quality turnovers

The staff has developed and is executing a procurement strategy that relies on the expertise in advanced reactor designs provided by the DOE laboratories. The staff has placed four basic task order agreements with the DOE laboratories (Oak Ridge National Laboratories, Brookhaven National Laboratory, Sandia National Laboratory, and Pacific Northwest National Laboratory) and has issued several task orders against these agreements. The staff is relying on the DOE laboratories for support in the resolution of generic policy and technical issues, development of guidance documents for both staff and industry, and preapplication reviews of topical reports and white papers submitted by potential suppliers. The staff is developing its longer term contracting strategy, which will likely involve commercial contractors for the review of actual design and licensing applications. The staff anticipates forwarding a Chairman paper outlining these strategies during the second quarter of FY 2011.

Consistent with its approved procurement strategy, the staff is also working with the DOE national laboratories to develop training for both HTGRs and iPWRs. During this fiscal year, the staff was successful in coordinating preliminary training sessions on HTGRs and iPWRs. The staff is assessing feedback from these preliminary training sessions and, with support from the DOE national laboratories, will develop and implement a rigorous training program to address skill gaps and infrastructure gaps within the NRC.

### **INTERNATIONAL ACTIVITIES**

The NRC is continuing to use international experience and lessons learned to ensure safe designs both domestically and internationally. All new reactor designs under review in the United States are also under review, being constructed, or in operation in other countries. During this period, NRO participated in multilateral and bilateral activities directly or as part of the Multinational Design Evaluation Program (MDEP), attended conferences and workshops, hosted assignees from other regulators, and supported requests for expert participation by the International Atomic Energy Agency.

#### **Multinational Design Evaluation Program and Bilateral Cooperative Activities**

During the week of October 25, 2010, NRO staff chaired the 8<sup>th</sup> meeting of the MDEP Issue-Specific Digital Instrumentation and Controls Working Group in Paris, France. The group agreed on three technical positions that will be forwarded to the Steering Technical Committee for approval. The group has completed four of the first eight positions identified and established a goal of identifying 15 positions by the end of 2011.

On November 15–18, 2010, staff from NRO participated in an MDEP EPR Digital I&C Working Group meeting in China. The staff discussed EPR instrumentation and control issues and common positions among the MDEP member countries.

During the period November 16–18, 2010, the NRO branch chief participated in a meeting of the MDEP Codes and Standards Working Group (CSWG) held at the headquarters of the Organization for Economic Cooperation and Development’s Nuclear Energy Agency in Paris, France. This was the sixth meeting of the MDEP/CSWG, and its purpose was to review the work products being developed by the CSWG to achieve international harmonization of code requirements for pressure boundary components and to discuss the status of the code comparison project being performed by standards development organizations of several MDEP member countries in support of CSWG’s efforts.

During the week of December 13, 2010, NRO supported bilateral meetings with the regulatory authorities of Canada (CNSC) and South Korea (KINS) on the licensing and siting of advanced reactors, construction inspection and implementation of ITAAC, and the design review of the ESBWR.

Vendor Inspection

During the week of November 11–15, 2010, NRO staff members participated in an American Society of Mechanical Engineering Section III meeting in Vancouver, Canada.

During the week of December 6–10, 2010, the NRO staff traveled to Japan to perform a QA implementation inspection at MHI to inspect the QA program supporting the US-APWR DC application, in accordance with the requirements of Appendix B, “Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants,” to 10 CFR Part 50 and 10 CFR Part 21.

**FUNDING**

Committed and Obligated Funding

The following tables reflect the FY 2011 first quarter committed and obligated funding:

NRO CASE WORK ONLY

<b>FY 2011 Funding</b>	<b>1<sup>st</sup> Quarter</b>
Commitments	\$1,445,794.42
Obligations	\$856,372.42

NRO–ALL OTHER NON-CASE WORK (PROGRAM MANAGEMENT, POLICY AND ANALYSIS WORK)

<b>FY 2011 Funding</b>	<b>1<sup>st</sup> Quarter</b>
Commitments	\$3,491,808.49
Obligations	\$1,737,193.44